BARBADOS.

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INSTITUTE

ANNUAL REPORT

OF THE

Department of Science and Agriculture

FOR THE YEAR

1939—40.

Printed by the Advocate Co., Ltd.
Printers to the Government of Barbados.

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REPORT ON THE WORK OF THE DEPARTMENT OF SCIENCE AND AGRICULTURE

For the Year Ending the 31st March, 1940.

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FOREWORD

For reasons of economy, the quarterly issue of the Barbados Agricultural Journal will be discontinued. The Journal will be replaced by an Annual Report and by a series of pamphlets which will be issued when the results of experimental work conducted by officers of the Department justify such publications.

S. J. SAINT,

Director of Agriculture.

STAFF

Dr. S. J. Saint visited Vieux Fort, St. Lucia, from the 12th to the 19th of July, 1939, on duty leave, and Trinidad from the 6th to the 12th of November, 1939.

2. Dr. A. E. S. McIntosh was absent from the colony on vacation leave from the 20th of June to the 25th of October, 1939.

3. Mr. R. W. E. Tucker was absent from the colony from the 29th of March to the 7th of June, 1939. He proceeded on duty leave to Brazil to obtain dipterous parasites of the larval stage of *D. saccharalis*.

4. Mr. B. Johnston, B.Sc., A.I.C.T.A., was appointed to the newly created office of Chemist to this Department on the 7th of August, 1939.

5. On the 1st of August, 1939, Mr. F. E. Bynoe, Fourth Agricultural Assistant, was appointed a Junior Peasants' Agricultural Instructor, and Mr. L. H. Atkinson, Fifth Agricultural Assistant, was promoted Fourth Agricultural Assistant. The vacant post of Fifth Agricultural Assistant was filled by the appointment of Mr. W. M. Foster.

SECTION I.

GENERAL AGRICULTURE.

1. WEATHER CONDITIONS.

6. The main feature in the rainfall figures for the year 1939 is the very low rainfalls for the critical growing months—June to September inclusive. During these four months the total rainfall was only sixty per cent of the average of the previous twenty year period. During this low rainfall period the growth of the cane crop was severely retarded. In October and November average rains were experienced and the crop was making a wonderful recovery but suffered a severe set-back by low December and January and especially February rainfall. The dry weather caused a forced ripening in a crop just becoming vigorous and resulted in juice of lower purities than average and consequent lower factory recoveries.

7. The weather, although unfavourable to the cane crop, was suited to cotton growing and although only 120 acres were grown, the yields of seed cotton, especially from plantations, was very good.

2. SUGAR CANE.

8. During the 1939 crop season, there were manufactured 133,296 tons of sugar by vacuum pan factories, 2,961 tons of muscovado sugar, and 6,661,318 wine gallons of fancy molasses, which, at the rate of 330 wine gallons to the ton of sugar, may be equated as the equivalent of 20,186 tons of sugar. The total crop reaped in 1939, therefore, amounted to the equivalent of 156,443 tons. This is the largest crop the island has ever produced, and is the result of the abnormally heavy rainfall experienced during the latter part of 1938.

9. The crop to be reaped in 1940, which will be reported on more fully in our next annual report, is estimated to reach the equivalent of 97,000 tons.

10. The position with regard to local consumption of sugar and exports of sugar and fancy molasses during the second quota year may be summarised as follows:—

			Tons.
Estimated stocks in hand for export at 1st September, 1938:			
Fancy molasses	12,360 tons.		
Sugar	140 ,,		12,500
Production: Crop 1939			156,443
			168,943
Estimated stocks in hand for export at 1st September, 1939:			
Fancy molasses	10,019 ,,		
Sugar	439 ,,		10,458
			158,485
Total exports for second quota year as per Customs returns:			
Fancy molasses	22,466 ,,		
Sugar	128,150 ,,		150,616
Difference, representing sugar for local consumption			7,869

11. The returns received from plantations for the 1940 crop show that there were 34,725 acres under cane made up of 15,618 acres of plant cane, 11,811 acres of first ratoons, 5,599 acres of second ratoons, 1,519 acres of third ratoons and 178 acres of fourth and fifth ratoons. In addition, the acreage of cane estimated to have been reaped by small holders is 7,000.

12. The percentages of the total acreage under the various varieties reaped in 1940 are as follows:—

	Varieties:					
	B.2935	B.H. 10 (12)	B.726	B.3013	B.3127	Other and mixed varieties
Percentages	43.01	23.15	19.48	8.26	2.20	3.90

13. At the end of December 1938, there were nearly 6,000 puncheons of fancy molasses remaining unsold in Barbados and production during 1939 totalled approximately 60,550 puncheons, making an exportable total of 66,550 puncheons for 1939. At the end of December 1939, this entire amount had been exported. For the year 1940, in consequence of an increased demand for fancy molasses in Canada and the United States of America, 81,000 puncheons have been allocated for production.

3. COTTON.

14. During the year under review, one hundred and twenty acres of cotton were grown commercially. Growth on the whole was good and yields of seed cotton better than for several seasons past. The total acreage planted was 120 which yielded 55,131 lb. seed cotton or an average of 459.34 lb. per acre. This was equivalent to 118 lb. lint per acre.

4. MINOR CROPS.

15. *Fruit Trees.* The propagation and distribution of fruit trees is rapidly expanding although orders still exceed the supply. The Department continues to import from St. Lucia nuts of the dwarf variety of coconut for distribution to growers. Investigations into mango propagation work are leading to the use of a simple "T" graft method for routine propagation work in place of the laborious inarching. Top-working of commercially useless mango seedlings has been started with some success and it is the intention to develop this work.

16. *Ground Provisions and Pulses.* Numerous imports of varieties were made during the year for test against the local varieties. Improvement in local yields by this method would not however appear to be promising. It is considered that great improvement in the local variety material could be effected by plant breeding were facilities available for this work.

17. During 1939, 5.5% of the arable acreage was planted in food crops as against 8.3% in 1938. The difference is due to the low rainfall of 1939.

18. *Vegetables.* It is evident as a result of inspections that the area growing vegetables is steadily expanding, more especially among small holders. Tem-

perate country vegetables undoubtedly grow best in Barbados during the months November—June and any appreciable expansion particularly during the second half of this period, will be retarded by lack of watering facilities. Vegetables are scarce and expensive during this period and serious consideration is being given to schemes directed to facilitating the sinking of wells, pumping water and irrigation.

5. LAND SETTLEMENT.

19. During the year under review the Vieux Fort Estate in St. Lucia which was purchased for the land settlement of Barbadians was further developed. The factory produced 1,050 tons sugar in 1940 and it is estimated that the crop will reach about 2,000 tons of sugar in 1941. A model settlers' village, comprising 100 houses was established in the Beausejour district. These houses are now all occupied by Barbadian families and each family averages slightly under four persons.

20. Each settler's holding consists of a house, which is purchased on an instalment basis over a period of 15 years, and a four-acre plot of arable land held on a ninety-nine year lease. The house is situated on a quarter-acre of arable land, which the settler holds on the same terms as the four-acre plot.

6. SEED AND PLANT DISTRIBUTION.

21. *Ornamental Plants.* A total of 27,464 ornamental plants were distributed during the year and 9,779 of these were distributed free or at a nominal cost during Arbor Week.

22. *Fruit Trees.* A total of 1,691 fruit trees were distributed during the year and comprised breadfruit, citron, fig, grape, grapefruit, guava, lime, lemon, mandarin, mango, orange, avocado pear, pomelo and shaddock. In addition, the "top-working" of Julie scion material on to common mango trees in the island has been undertaken and a total of 145 trees were top-worked.

23. *Planting Material.* A great variety of planting material was multiplied for distribution at Codrington Experimental Station including sugar cane, sweet potatoes, sweet cassava, Guatemala grass, dwarf (Canary) banana, pineapple, christophine, pigeon pea, tepary bean, cowpea, upright bonavist bean, soya bean, upright bean, okra, Barbados cucumber, vegetable marrow, cantaloupe, sweet corn (U.S.D.A. 64), guinea corn, sesame, Italian millet, eschalot and artichokes.

24. *Vegetable Seeds.* Very considerable amounts of vegetable seeds have been imported from reliable firms during the year. These seeds comprise varieties which by tests conducted by the Department are shown to be best suited to local conditions and are distributed at cost price to peasants. In the past, the seeds have only been obtainable at the offices of the Department but this year, with the permission of the Board of Education, nine elementary school headteachers were selected at key positions in the various parishes and provided periodically with seeds of the principal vegetables for sale in their respective districts. These teachers have co-operated very well in this scheme which was so successful as to warrant its continuance. In addition the three Peasant Agricultural Instructors have also carried out this work.

7. FOOD PRODUCTION IN WAR TIME.

25. Under Regulation 50 of the Defence Regulations, 1939, the Vegetable Production (Defence) Control Order, 1939, was issued and the planting of food crops by plantations was made compulsory.

26. In September, 1939, the owners of plantations were required to plant five per cent. of their arable acreage in one or more of the crops—sweet potatoes, cassava, maize, peas and beans. The time of harvesting these crops has been controlled to admit of an even marketing of the supply.

27. For the season 1940-41 the owners of plantations are required to plant ten per cent. of their arable acreage in food crops. These vegetables comprise yams, sweet potatoes, eddoes, corn, guinea corn, peas and beans.

8. AFFORESTATION SCHEME.

28. There are in Barbados about 5,000 acres of land classed as unusable. It has been decided to encourage the growing of casuarinas on this land with the object of:—(a) preventing soil erosion and mass movement (b) conserving soil moisture and improving soil texture (c) providing windbreaks and (d) providing firewood.

29. As an inducement to plant trees, the Department has published articles, made surveys and is undertaking to supply young trees, free of charge, to all who intend to participate in the scheme. Applications have already been received for trees to plant approximately 370 acres.

SECTION II.

WORK OF DEPARTMENT OF AGRICULTURE.

1. BOTANICAL SECTION.

(a) *Sugar Cane Breeding.*

30. *B.42' Series.* The 1939 season was a very poor one for arrowing and many of the intended crosses were unobtainable; to compensate for this however the germinations were excellent. A total of 66 crosses were made of which only 6 were noble crosses and after growing 52,470 seedlings 17,145 were eventually planted in the field nursery.

31. *B.41' Series.* The number of seedlings selected for planting in October 1939 was 8,747 of which 3,543 were from noble cane crosses. This trial will be reaped in 1941.

32. *B.40' Series.* In this series, 9,216 seedlings were planted in 1938 and 292 were selected during reaping this year for further trial.

33. *B.39' Series.* In this series 100 noble cane and 134 nobilised seedlings were selected during the 1939 crop and these were multiplied at Codrington Experiment Station until November. All the selected noble canes were planted in plots at Dodds for multiplication and gumming disease resistance tests. Ninety-two nobilised seedlings were selected and allocated as follows:—

(a) Central Sugar Cane Breeding Station—Thick cane trial at Codrington for 1939–41—45 seedlings—Standards B.2935 and P.O.J. 2878.

(b) Central Sugar Cane Breeding Station—Thin cane trial at Codrington for 1939–41—24 seedlings—Standards Co.213.

(c) For breeding work at Lion Castle—17.

(d) For multiplication at Dodds —6.

34. *B.38' Series—Noble Canes.* These were selected from the first year seedling trials in 1938, multiplied at Codrington and in November sent to Dodds for further multiplication and gumming disease resistance tests. Out of 98 seedlings 49 were eliminated on account of poor appearance in the field and susceptibility to gumming disease. The remainder were planted in second year seedling trials at Dodds, Todds and Vaucluse in November 1939.

35. *B.38' Series—Nobilised Seedlings.* These selections, made in the multiplication plots at Codrington Experiment Station in October 1938 were tested in a second year trial at Codrington during the season 1938–40. Selections on reaping were as follows:—

(i) Thick cane trial—Standards B.2935 and P.O.J.2878.
Out of 43 reaped 7 were selected.

(ii) Thin cane trial—Standard Co.213.
Out of 32 reaped 8 were selected.

Selections from the above trials were allocated as follows:—

(a) Select Seedling Trials, Barbados	9	seedlings
(b) Plant Quarantine Station, Trinidad, for trial in other West Indian Islands	15	„
(c) Lion Castle for breeding work	15	„

36. *B.37' Series—Noble Canes.* These were selected from the multiplication plots and gumming disease tests at Dodds in November 1938 and planted in second year trials which were reaped during the present crop. Selections from these trials were as follows:—

Early Group—Dodds and Vaucluse. Out of 22 seedlings reaped the following were selected:—B.3703, B.3708, B.3734, B.3737 and B.3739.

Late Group—Dodds and Todds. Out of 34 seedlings reaped the following were selected:—B.3771, B.3774, B.3775, B.3777, B.3791, B.37107 and B.37111.

(b) *Special Investigations.*

37. *Growth Measurements.* During the season 1938-40 growth measurements were carried out on the following newer seedlings in the plant cane maturity experiments at the low rainfall station Belle and the high rainfall station Blowers: B.3518, B.3521, B.3525 and B.3540. For purposes of comparison the following standard varieties were included: B.H.10(12) (high rainfall station) B.726 (high and low rainfall station) and B.2935 (low rainfall station).

38. In addition to the above, growth measurements were also carried out on the following seedlings and standard varieties in the first ratoon maturity experiment at the high rainfall station Bowmanston:—B.H.10(12), B.726, B.3419, B.35187, B.35245.

39. *Gumming Disease Resistance Test.* During the season 1938-40, 99 noble canes and 115 nobilised seedlings were tested at Dodds for their resistance to gumming disease and 69 noble canes and 109 nobilised seedlings showed no symptoms of gumming.

40. *Sugar Cane Mosaic Disease Resistance Test.* During the period January 1939 until April 1940 a total of 134 nobilised seedlings have been tested for mosaic disease resistance and, of these 43 proved to be susceptible. The remaining 91 seedlings are still undergoing test.

(c) *Cotton.*

41. Of the seed cotton which was obtained from the progeny rows during the season 1937-38 three plants were retained from the strain B.170-2 and numbered B.1, B.2 and B.3, whilst two plants were selected from B.170-4 and numbered B.4 and B.5. Duplicate progeny rows of thirty-six plants of each of these selections were sown during the season 1938-39.

42. Since it was impossible to obtain the necessary number of bolls for analysis from the plants selected in the progeny rows during the 1938-39 season, it was decided, for season 1939-40 to use in place of seed from the single plant selections, selfed seed from certain of the "bulk samples" from the progeny rows. Seed was selected from B.1—Row 2, B.3—Row 2 and B.4—Row 1 and numbered B.1, B.3 and B.4 respectively.

43. During the present season 1939-40, each selection was sown in duplicate rows of forty-five plants. Two plants were selected in each row, the flowers were selfed and the seed cotton was bagged separately. The flowers on the remaining plants in each row were also selfed and the seed cotton from each row was bagged separately. This seed will be grown to provide commercial planting material for the 1941-42 crop.

44. During the year a trial was carried out to test the yields of the two principal Barbados cotton strains and also a variety trial with six varieties to compare the Barbados strain with the St. Vincent, Montserrat and Nevis strains.

(d) *Minor Crops.*

45. The work carried out in recent years on the improvement of existing minor crops and the importation of new ones has already been reported in detail in the Agricultural Journal, Vol. 9 No. 1 and will not be dealt with in this Report.

2. CHEMICAL SECTION.

(a) *Analytical Work.*

46. *Food and Drugs.* The total number of samples examined during the year for the various Departments of Government and for private individuals was 1,269.

47. *Police Department.* Particulars of the various samples received from the Police and examined during 1939 are as follows:—

Viscera and examinations for poisons	56
Coins and counterfeiting exhibits	8
Butters, margarines and cooking oils	56
Milks	78
Tea, coffee, cocoa, tapioca, flour, etc.	119
Rum	60
Miscellaneous	40
	417

48. *Customs Department.* The following samples were received from the Customs:—

Petroleum	41
Condensed milk	11
Butter and margarine	26
Textiles	25
Miscellaneous	22
	125

49. *Public Works Department.* Monthly analyses were carried out on the water as supplied to the general public during the year and, in addition, determinations were made from time to time on the free chlorine content of the drinking water. An examination was made of the fuel oil as supplied to the main pumping stations.

50. *Department of Agriculture.* The samples examined for this Department consisted of water and molasses in connection with the Vieux Fort Land Settlement Scheme. An examination was carried out on samples of fancy molasses destined for the American market. The use of a special type of filtering crucible was investigated and adopted. The protein content of a sample of soya bean meal was determined and the food value of a locally grown tepary bean was also investigated.

51. *Sanitary and Parochial Departments.* One hundred and twenty-four samples of milk of which twenty samples were adulterated were submitted by the Commissioners of Health of St. Michael. The free chlorine content of the E.C. Disinfectant supplied by the Commissioners of Health was ascertained periodically. Eight samples of salted fish were submitted for examination and four samples were found unfit for human food. Four samples of water from relatively shallow wells were submitted. All samples were found fit for drinking and domestic purposes.

52. *Agricultural Society.* One hundred and forty-one samples of feeding stuffs and twenty-six samples of fertilizers were submitted by the official samplers under the Fertilizers and Feeding Stuffs Act. All samples conformed to their guaranteed analysis. One hundred and twelve samples of sugar and fancy molasses were examined in connection with the prize awards of the Annual Industrial Exhibition. Reports on these analyses are submitted to the Secretary, Barbados General Agricultural Society.

53. *Other Government Departments.* Thirty-one samples of E. C. Disinfectant were examined for the Barbados General Hospital in connection with the proper functioning of their plant. Samples of condensed milk were examined for the Board of Education in connection with the feeding of milk to school children.

54. *Private Individuals.* The following analyses were carried out under this head during the year:—

Sugars and molasses	110
Cane juice	41
Fertilizers	21
Petroleum	9
Milks	4
Miscellaneous	24
	209

55. The fees receivable by Government for these analyses amounted to £178. 6. 0.

56. *Commercial Analysis of Sugars and Molasses.* The number of samples of sugars and molasses examined during the crop 1939—40 was 57,103, and constitutes a record for the Laboratory. As many as 1,165 samples were analysed during a single day. The revenue receivable by Government for these analyses amounted to £2,855. 3. 0.

57. *Analysis of Seedling Canes.* During the year, a total of 542 bundles of cane were analysed. Of these, 206 were in connection with manurial trials, and 336 were in connection with seedling and variety trials.

(b) *Advisory and Investigational Work.*

58. *Sugar Technology.* Through the kindness of the owners and the managing staff, experimental boiling in the Government Experimental vacuum pan was carried out at Bulkeley Factory. This work consisted mainly of an investigation of various methods of graining and boiling by the aid of the cuitometer. Among the latter, the two boiling system as suggested by A. L. Webre, Int. Sugar Journal, Vol. XLI, 1939, p. 304, was tried out. Although the resulting sugar did not cure well, the results were such as to suggest that this method might have considerable possibilities. An "A" molasses with an apparent purity of 55 was grained by seeding with icing-sugar and gave, after seven hours boiling, a "C" strike, the final molasses obtained having an apparent purity of 35. During the crop, this two boiling system was adopted successfully by Guinea Factory where a shortage of A sugars necessitated its utilisation. In this case, however, the two boiling system was actually only partially adhered to, as molasses of two different purities, 50 and 65, were available. Seeding was carried out with icing-sugar, and it was found best to seed the molasses of higher purity and to boil in that of lower purity on the resulting grain. A "C" strike of 55 apparent purity was obtained, the boiling lasting 8 hours. Final molasses of low apparent purities 29 and 30 were recorded.

59. *Manurial Trials.* Three manurial trials on sugar cane were reaped during 1940, a fourth being abandoned as the canes had been damaged by fire. Those trials were designed (a) to investigate the effect of variations in the amounts and combinations of nitrogen, potash and phosphate on the yield and juice quality, and (b) to investigate the effect of varying amounts of potash applied as nitrate and as muriate of potash upon the yield and per cent. sucrose in juice. The former was carried out in the Scotland area of St. Joseph, where juices of poor quality, possibly due to late manuring of the cane, have been obtained, and the latter on representative red and black soil plantations. The differences recorded in yield and juice quality in both cases were small and would not permit the drawing of any definite conclusions.

60. The permanent manurial trials on sour grass, which were laid down at a red and black soil centre in 1931 were continued but as no fresh information has been obtained in recent years it is intended to terminate those trials in 1941. With this in view, the treatments have been altered so as to display the residual effect of the previous manuring.

61. *Soils.* A series of analyses of available manganese were carried out on representative samples of the various soil types found in Barbados. Judged by Australian standards, where one hundred parts per million is regarded as sufficient for a healthy soil, those soils are not deficient in this nutrient.

62. *Arrowroot Manufacture.* The Arrowroot Factory at Chalky Mount started operations on the 1939-40 crop on March 16th, 1940, and finished on May 4th. A total of 45,237 lb. roots was crushed, and 7,658 lb. starch manufactured. The yield of seventeen pounds starch per one hundred pounds of roots is low, and indicates a loss of efficiency on previous years when 18.8 lb. were obtained. Fortunately, this may be offset by better starch prices this year. The small quantity of roots received is also very disappointing; this is partially due to the somewhat adverse weather conditions this year, but more particularly to the lack of co-operation between the members who constitute the Association; thus, some arrowroot was privately manufactured by members of the Association themselves. The planting of larger areas in arrowroot is very desirable if this factory is to operate with any efficiency. When it is remembered that

the plant was designed to handle about two tons of roots per day, the above quantity represents but little more than a week's continuous run.

3. ENTOMOLOGICAL SECTION.

63. The Entomologist spent the first part of the year under review in Brazil (States of Sao Paulo and Minas Geraes) where dipterous parasites of the larval stage of *D. saccharalis* were collected. Supplies of the melanic race of *Metagonystylum minense* and a considerable number of *Paratheresia diatraea* were obtained and successfully transferred to Barbados.

64. On returning to Barbados in June 1939, *M. minense* was reared in large numbers in the laboratory and colonised all over the island. Exchanges of material were made with Puerto Rico; also, the wet area or Amazon race of *M. minense* was introduced from Vieux Fort, St. Lucia, and various crosses between the races were made. The parasite *Paratheresia diatraea* was not successfully mass reared in the laboratory, and after three months the few remaining males and mated females were liberated in the cane fields.

65. At the same time as the above work was proceeding the mass rearing of the egg parasite *T. minutum* progressed on normal lines and production of parasites for field colonisation reached 342 millions, a higher level than in any other year.

66. The abnormally low rainfall of 1939-40 was adverse to all of the above parasites and investigations up to the end of March, 1940, show that though a few recoveries were made, the introduced *M. minense* of various races and crosses did not establish itself and had no direct effect on infestation by *D. saccharalis*. Laboratory breeding and field liberations of this parasite are still continuing.

67. Investigations on the effect of liberations of *Trichogramma* in 1939 showed that in the crop reaped in 1940 total loss caused by *D. saccharalis* was reduced.

68. Progress has also been made in correlating loss caused by *D. saccharalis* and varieties of cane, and in testing rind hardness of cane in relation to borer damage.

69. Damage by *D. abbreviatus* (cane root borer) and *L. smithi* (cane hard back) still remains at a reduced level.

70. Damage by *P. gossypiella* (pink bollworm) was again reduced to so low a level that none was found by inspection nor reported by growers. Spraying of cotton with lead arsenate was more universally carried out in 1939, with resultant diminution of defoliation by *A. argillacea*.

71. Despite past advice and frequent recommendations to spray sweet potatoes with lead arsenate as a combined measure against defoliation and infestation by *E. postfasciatus* (scarabee) the lack of spray apparatus and materials resulted in severe defoliation of sweet potato fields, of which a considerable additional acreage was planted as a war time food supply measure.

72. Steps have been taken to secure protection by the planters of recent greatly extended plantings of food crops, against the insect pests which are likely to be cumulative in their attacks, although spray apparatus and materials at present available are quite inadequate.

73. *Termites.* The species of termites at present identified from Barbados are *Cryptotermes brevis*, *Heterotermes tenuis*, *Coptotermes havilandi* and *Nasutitermes costalis* and unnamed, and probably a new species of *Kalotermes*, *Neotermes* and *Cryptotermes*. Of these species *Coptotermes havilandi* causes the most severe damage to buildings in Bridgetown and appears to be

spreading. It is an Asiatic species introduced apparently from the Malay regions or from Mauritius where it also occurs. At present Barbados is the only place in the West Indies from which this species is definitely recorded.

74. The species *Coptotermes testaceous, Termes hispaniolae* and *Nasutitermes octopilis* have also been identified* as importations in wallaba firewood from British Guiana, but these species have not at present been found established in Barbados. Specimens suspected to be, but not identified as *C. havilandi* were found in this imported wallaba wood in the year under review.

75. During the year under review there has been a noticeable attack on pigeon pea bushes (*Cajanus cajan*) (*indicus*) by a species of jassid, probably *Empoasca fabalis* De Long; in many cases injury was severe, possibly due to transmission of a virus as well as to the direct effect of the feeding of these leaf hoppers. The same leaf hopper was also found causing damage to fields of sweet potato; the indications again being that damage to growth was not entirely due to the numbers alone of this jassid.

76. The local manufacture of thallium baits under the direction of the Secretary of the Barbados Agricultural Society continues to give very satisfactory results. The Government subsidy of £250 is utilised in reducing the cost of these baits.

4. PLANT DISEASE INSPECTION.

77. *Mosaic Disease of Sugar Cane.* Routine inspections of the cane crop were carried out until the growth of the cane made adequate inspection for mosaic disease impossible. During the course of inspections a heavy infection was found in the tenantries at Cleavers Hill and St. Elizabeth's Village, St. Joseph, and these areas together with Orange Hill Tenantry, St. James, were added to the list of Proclaimed Infected areas during the year.

78. The Corn Close Season had been proclaimed for the usual period, 16th of December, 1939, to 31st of March, 1940, but owing to the dry weather it was decided to shorten the period from the 1st of February, 1940, to the 31st of March, 1940 so that peasants would be able to obtain fodder for their animals

79. During the planting season, persons within the Proclaimed Infected Areas were supplied with mosaic disease free cane plants as usual and wherever possible the mosaic disease resistant variety B.35187 was distributed.

80. The results of the annual inspection show that in the parish of St. Michael the majority of infested holes are found in the tenantries of Bank Hall and Goodland where the infection is essentially of a secondary nature. In the parish of St. John infection still remains high in the tenantries of Venture, Sherbourne and Bakers. Heavy infections were found in the tenantries of Cleavers Hill and St. Elizabeth's Village in the parish of St. Joseph in the tenantry of Orange Hill, St. James and in Workman's tenantry, St. George. All of these tenantries have been placed on the list of Proclaimed Infected Areas. Elsewhere in the island mosaic disease has been kept well under control.

81. The acreages inspected and the number of infected holes found in the various parishes during 1939 were as follows:—

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* Identifications of Termites from Barbados are made by Dr. A. M. Adamson, College of Tropical Agriculture, Trinidad.

	PARISHES:								
	St. Michael	Christ Church	St. Peter	St. James	St. Thomas	St. Joseph	St. George	St. John	St. Andrew
Acreage inspected	2,765	3,579½	2,069¼	1,013¼	1,393¼	732¼	1,585½	1,317½	777¾
Number of infected holes	2,403	318	220	1,886	965	3,205	420	901	131

82. *Cotton Inspections.* During the period under review no pink bollworm was found either in the field or at the ginnery. The cotton leaf worm, *Aletia argillacea,* made its appearance at the usual time, in the month of December, but this pest was kept in check by dusting and spraying.

83. The holds of fifteen ships were fumigated with "Zyklon B" and 9,613 bags of imported cotton seed were disinfected by means of the Simon's heater during the year.

84. Inspections of articles suspected to contain cotton were also carried out under the provisions of the Cotton Diseases Prevention (Amendment) Act, 1937-24.

85. The Okra Control Season was extended from the 1st of July, 1939 to the 31st of October, 1939, and during this period okras may only be grown with the permission of the Director of Agriculture.

86. The following miscellaneous imported planting material was inspected during the year:—

594	Pkgs. Bulbs, Rose Trees, Orchids, Vegetable and Flower Garden seeds	Examined & Passed.
355	Coconut Plants	,, ,, ,,
2	Boxes Seed Coconuts	,, ,, ,,
3	Pkges. Cherry Trees	,, ,, ,,
27	Pkgs. Orchid Plants	,, ,, ,,
36	Orchid Plants	,, ,, ,,
2	Pkgs. Citrus Plants	,, ,, ,,
2	Pkgs. Lily Plants	,, ,, ,,
1	Lily Plant	,, ,, ,,
10	Pkgs. Bulbs	,, ,, ,,
1	Pkg. Bougainvillea Cuttings	,, ,, ,,
6	Pkgs. Hibiscus Cuttings	,, ,, ,,
1	Barrel Cactus Plants	,, ,, ,,
1	Fern	,, ,, ,,
2	Bundles Christmas Trees	,, ,, ,,
1	Pkg. Rose Trees	,, ,, ,,
13	Pkgs. Miscellaneous Plants	,, ,, ,,
15	,, ,, ...	,, ,, ,,

2	Ixora Plants	Roots Washed.
1	Pear Plant	„ „
9	Mango Plants	„ „
2	Ferns	„ „
1	Citrus Plant	„ „
2	Pkgs. Gardenia Plants	„ „
9	Pkgs. Miscellaneous Plants	„ „
47	Coconut Plants	Destroyed.
1	Bag Coconut Plants	„

87. In accordance with regulations made in Trinidad (Trinidad & Tobago No. 13 of 1938), 314 certificates were issued during the year; this entailed the inspection of 1,464 packages of vegetables.

5. PEASANT AGRICULTURE.

88. A Third Peasants' Agricultural Instructor was appointed on the 1st of August, 1939. He is stationed in St. Philip and is responsible for instruction in the two large parishes of St. Philip and Christ Church.

89. Twelve lectures were given by the Instructors to peasants and forty-five to pupils of the elementary schools during the year on various horticultural and agricultural subjects.

90. The fifty school vegetable gardens in the island were inspected for the purpose of deciding which were the four best kept throughout the year. Most of these gardens were inspected on three separate occasions during the year. From these visits it is evident that teachers are becoming more conscious of the value of gardening in elementary schools. These visits also help to sustain interest in the garden, and more especially to encourage an economical growing of crops.

91. Three hundred and ten districts were visited during the year by the Peasant Instructors. Advice was given on many subjects including:—selection of sites for the planting of vegetables, ground provisions and fruit bearing trees, spacing distances, selection of planting material, seed sowing rates, time and methods of planting, mulching, dry farming, prevention of soil erosion, manures and manuring, rotations, insect pests and fungoid diseases and their control, harvesting stages of vegetables and fruits, the afforestation scheme, cultivation of the grape vine, after treatment of budded, grafted and/or top-worked fruit bearing trees, apiculture, value of home grown food crops, poultry rearing, mixed farming methods, the use of the Peasants' Loan Bank, the formation of District Agricultural Societies, Juvenile Societies and "4-H" Clubs.

92. Demonstrations were also given on the top-working of mango trees, budding of citrus, pruning, spraying and other similar practices.

93. Distribution was made to peasants of the following planting material:—cassava, sweet potatoes, mosaic disease resistant varieties of sugar cane, fruit trees, various ground provisions, vegetable and fodder crops.

94. *Goats.* Three purebred British Alpine bucks were stationed at the following centres:—(1) Airy Hill, St. Joseph, (2) Holetown, St. James and (3) Wason's House, St. Philip. One hundred and twenty-eight does were served by these bucks and free service for peasants is greatly appreciated. It is evident, however, that if the general improvement of milch goats is to be expedited more sires are necessary.

95. *Poultry.* With the object of increasing the egg-production and the table quality of the local poultry, five hundred and twenty-nine eggs were distributed for sitting. Of these, three hundred and eighty-one were Leghorn and

the remainder a special cross (Rhode Island Red x Local Bareneck). Twelve purebred Rhode Island Red cockerels were also distributed.

96. *Turkeys.* Six hens were penned with the three-quarter bred turkey cock stationed at Airy Hill, St. Joseph.

97. *Survey.* A survey of peasant agriculture is being carried out by the Peasant Instructors with the object of accumulating exact statistics of peasant agriculture.

98. *Peasants' Exhibition.* Vegetable fruit and live stock were well represented and of a high standard at the Local Agricultural Exhibition for Peasants which was held in November. There were some fine exhibits of clumps of canes and the new mosaic disease resistant variety B.35187 attracted wide attention.

6. THE PEASANTS' LOAN BANK.

99. The Peasants' Loan Bank was established in 1937 with the object of raising the standard of peasant agriculture by making loans for the payment of taxes, labour and purchase of artificial manures and by bringing back into cultivation such holdings as have been abandoned through lack of capital. Peasant owners are persons owning ten acres of land and under.

100. Loans and interest due on such holdings are a first lien and charge against the holding in respect of which a loan is made. Loans are advanced on the basis of twenty four dollars per acre of canes and thirty dollars per acre of "thrown-out" holdings but have recently been increased to thirty and thirty-six dollars respectively as a result of increased costs brought about by the war. Interest is charged at the rate of five per centum per annum.

101. Inasmuch as the total sum authorised for advance to the Bank remains in the Treasury and only such sums as are required to pay current expenses and to advance loans can be drawn, the capital of the Bank tends to diminish annually. This aspect of the Bank's finances has been brought to the attention of Government and, in addition, recommendations for extending the scope of the Bank have been submitted to the Legislature.

102. For the year 1939—40 a total amount of £1,305. 4. 2 has been loaned out to 263 persons. The holdings against which loans have been advanced total 412 acres of arable land of which 233 acres were growing canes and 179 acres were under preparation. The overhead costs of running the Bank for the year amounted to £453. 17. 11.

SECTION III.

AGRICULTURAL LEGISLATION DURING 1939-40.

1. 1939—14. 19th April, 1939.

   An Act to amend the Peasants' Loan Bank Act, 1936 (1936—55). This Act includes a few minor amendments to the original Act.

2. 1939—29. 5th July, 1939.

   An Act to amend the Department of Science and Agricultural Act, 1925 (1925—32), as amended by the Department of Science and Agriculture (Amendment) Act, 1935 (1935—68). This Act provided for the appointment of a Third Peasant Agricultural Instructor.

3. 1939—34. 14th August, 1939.

   Barbados Fancy Molasses Production and Export (Amendment) Act, 1939.
   An Act to amend the Barbados Fancy Molasses Production and Export Act, 1937 (1937—50).
   This Act amends the "crop year" to the 1st of September in any one year to the 31st of August in the succeeding year, and inserts a new subsection which calls for the payment to the credit of the stabilization fund of the succeeding year, any part of the stabilization fund remaining undistributed at the end of any crop year. Other minor amendments are also included.

4. 1939—45. 10th October, 1939.

   The Sugar Industry Agricultural Bank (Amendment) Act, 1939.
   An Act to amend the Sugar Industry Agricultural Bank Act, 1907 (1907—4).
   This Act includes minor amendments to the principal Act.

5. 1940—5. 22nd January, 1940.

   An Act to repeal and re-enact with modifications the provisions of the Sugar Production and Export Control Act, 1938 (1938—55).
   The essential differences between the original Act and this modified one are:—

   (1) Sugar as defined in the new Act does not include fancy molasses.

   (2) Export permits for sugar are now issued on the signature of the Chairman of the Board, instead of by the Governor-in-Executive Committee thereby avoiding delay and consequent inconvenience to Customs authorities and sugar dealers.

   (3) The Regulations passed under the original Act are incorporated in the new Act.

S. J. SAINT,

Director of Agriculture.